

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (Currently Amended) A composite material comprising an active solid and a phase change material, ~~characterized in that~~ wherein:

- the phase change material takes the form of micronodules having an average size of between 1 micron and 5 millimeters;
- the phase change material is selected from materials with a liquid/solid phase change temperature of between -150°C and 900°C;
- the active solid is selected from solids that can be used in a method involving reversible physicochemical processes that are exothermic in one direction and endothermic in the opposite direction.

2. (Currently Amended) The composite material as claimed in claim 1, ~~characterized in that~~ wherein the active solid ~~is~~ comprises a reactive solid that can be used in a reversible chemical reaction.

3. (Currently Amended) The composite material as claimed in claim 2, ~~characterized in that~~ wherein the reactive solid is selected from halides, carbonates ~~and~~ or hydroxides.

4. (Currently Amended) The composite material as claimed in claim 1, ~~characterized in that~~ wherein the active solid is comprises a porous and/or microporous solid that can be used in a reversible adsorption process.

5. (Currently Amended) The composite material as claimed in claim 4, ~~characterized in that~~ wherein the porous and/or microporous active solid is selected from activated charcoals, zeolites, activated alumina ~~and~~ or silica gels.

6. (Currently Amended) The composite material as claimed in claim 1, ~~characterized in that~~ wherein the phase change material is a paraffin or a mixture of paraffins.

7. (Currently Amended) The composite material as claimed in claim 1, ~~characterized in that~~ wherein the phase change material is a congruent melting salt.

8. (Currently Amended) The composite material as claimed in claim 7, ~~characterized in that~~ wherein the congruent melting salt is selected from hydrated or unhydrated halides, hydrated or unhydrated carbonates, hydrated or unhydrated sulfates, phosphates, nitrates ~~and~~ or hydroxides.

9. (Currently Amended) The composite material as claimed in claim 8, ~~characterized in that~~ wherein the congruent melting salt is selected from CaBr_2 , CaCl_2 , KF , KCl , MgCl , NaCl , NaF , NH_4Cl , NH_4F , $\text{ZnCl}_2 \cdot 5\text{H}_2\text{O}$, $\text{KF} \cdot 4\text{H}_2\text{O}$, $\text{CaCl}_2 \cdot 6\text{H}_2\text{O}$, $\text{LiClO}_3 \cdot 3\text{H}_2\text{O}$, MgSO_4 , ZnSO_4 , Na_2SO_4 , $\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$, $(\text{NH}_4)_2\text{SO}_4$, Na_2HPO_4 , NaH_2PO_4 , $\text{NH}_4\text{H}_2\text{PO}_4$, NH_4NC_3 , $\text{Al}(\text{NO}_3)_3$,

$\text{Ca}(\text{NO}_3)_2$, $\text{Cd}(\text{NO}_3)_2$, KNO_3 , LiNO_3 , $\text{Mg}(\text{NO}_3)_2$, NaNO_3 , $\text{Ni}(\text{NO}_3)_2$, $\text{Zn}(\text{NO}_3)_2$,
 $\text{Zn}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$, $\text{Cu}(\text{NO}_3)_2$, $\text{Ba}(\text{OH})_2$ ~~and~~ or NaOH .

10. (Currently Amended) The composite material as claimed in claim 1, ~~characterized in that~~ wherein the phase change material is a metal.

11. (Currently Amended) The composite material as claimed in claim 10, ~~characterized in that~~ wherein the metal is selected from Al, Pb, Cu, Zn and alloys thereof.

12. (Currently Amended) The composite material as claimed in claim 1, ~~characterized in that~~ wherein the active solid takes the form of particles or monoliths.

13. (Currently Amended) The composite material as claimed in claim 1, ~~characterized in that~~ wherein it comprises a porous or microporous active solid, in the form of monoliths or particles, the micronodules occupying the pores of the active solid.

14. (Currently Amended) The composite material as claimed in claim 1, ~~characterized in that~~ wherein it is formed by mixing particles or monoliths of active solid and micronodules, the micronodules occupying the spaces between the particles or the monoliths of active solid.

15. (Currently Amended) The composite material as claimed in claim 1, ~~characterized in that~~ wherein it comprises particles or monoliths of active solid on the surface of which the micronodules are fixed, either by chemical grafting or by bonding with an adhesive.

16. (Currently Amended) The composite material as claimed in claim 1, ~~characterized in that~~ wherein it comprises particles of active solid fixed on the surface of the micronodules by chemical grafting or by bonding with an adhesive.

17. (Currently Amended) The composite material as claimed in claim 1, ~~characterized in that~~ wherein it comprises a mixture of particles or monoliths of active solid, and particles of a support material on which the micronodules are fixed.

18. (Currently Amended) The composite material as claimed in claim 1, ~~characterized in that~~ wherein it comprises one or a plurality of monoliths of active solid in which the micronodules are distributed.

19. (Currently Amended) The composite material as claimed in claim 1, ~~characterized in that~~ wherein it further contains expanded natural graphite.

20. (Currently Amended) A method for controlling thermal effects in a reversible physicochemical process between an active solid and a gaseous compound, said process being exothermic in one direction and endothermic in the opposite direction, ~~characterized in that~~ wherein the thermal effects are controlled by using a composite material as claimed in ~~one of claims 1 to 19~~ claim 1 as active solid.

21. (Currently Amended) A method for purifying a gas mixture by adsorption and regeneration by pressure modulation, called the PSA method, consisting in carrying out the

successive steps of pressurization and depressurization of at least one adsorbent bed by a gas mixture, in order to separate the gas mixture, ~~said method being characterized in that~~ wherein the adsorbent bed(s) comprise(s) a composite material as claimed in claim 1.

22. (Currently Amended) The method as claimed in claim 21, put into practice to obtain purified hydrogen from a gas mixture, ~~characterized in that~~ wherein the gas mixture to be processed is a hydrogen-rich mixture further containing CO₂ and CM₄, and in that said mixture passes successively through two adsorbent beds, the first comprising activated charcoal and micronodules of phase change material, the second comprising zeolite and micronodules of phase change material.

23. (Currently Amended) The method as claimed in claim 21, put into practice to dry air, ~~characterized in that~~ wherein the gas mixture to be processed is air containing water vapor and in that the adsorbent bed is a composite material comprising an alumina or a zeolite, and the micronodules are paraffin micronodules.

24. (Currently Amended) A method for storing gas by reversible adsorption on a porous solid, ~~characterized in that~~ wherein the porous solid is a composite material as claimed in claim 4.

25. (Currently Amended) The method as claimed in claim 24, ~~characterized in that~~ wherein the composite material comprises zeolite or activated charcoal.

26. (Currently Amended) A method for extracting oxygen from air by adsorption and regeneration by pressure modulation, called the VSA method, consisting in carrying out successive steps of pressurization by air and of placing an adsorbent bed under vacuum, ~~characterized in that~~ wherein the adsorbent bed comprises a composite material as claimed in claim 1.

27. (Currently Amended) The method as claimed in claim 26, ~~characterized in that~~ wherein said material comprises a zeolite and a paraffin with a phase change temperature close to 290K.